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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,507	06/30/2003	Michael E. Badding	SP03-079	2157
22928	7590	09/16/2005	EXAMINER	
CORNING INCORPORATED			WALKER, KEITH D	
SP-TI-3-1			ART UNIT	
CORNING, NY 14831			PAPER NUMBER	
			1745.	

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/611,507

Applicant(s)

BADDING ET AL.

Examiner

Keith Walker

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 and 17-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-16 and 23-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10-16 & 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Publication 2001/0044043 (Badding) in view of US Patent 4,272,353 (Lawrance).

Regarding claims 10-14, 16 & 23, Badding teaches a yttria-stabilized zirconia electrolyte for use in a solid oxide fuel cell ([0003] & [0004]). The electrolyte is flexible and has a thickness of 5-20 microns ([0042]). Possible doping oxides for the electrolyte are selected from the group of Y, Ce, Ca, Mg, Sc, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, In, Ti, Sn, Nb, Ta, Mo, and W and mixtures thereof ([0044]). The ohmic resistance of the cell is taught to be less than 0.2 ohm/cm<sup>2</sup> for the cell ([0051]). Therefore the electrolyte material by itself will have a resistance of less than 0.5 ohm/cm<sup>2</sup>.

While Badding further teaches the use of varying the sheet thickness by roughening up the electrolyte surface to improve the adhesion, he is silent as to the thickness variations.

Art Unit: 1745

For claims 10, 15 & 23-25, Lawrence also teaches roughening up the surface of the electrolyte to improve the adhesion. An average depth of groove from 4-10 microns varies the thickness of the electrolyte (6:65-68).

The motivation to use the roughened surface with the electrolyte is to provide a better adhesive surface for the electrolyte.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the roughened electrolyte of Badding with the electrolyte of varying thickness to improve the adhesive property of the electrolyte and improve the connection between the electrode and the electrolyte.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 10-16 & 23-24 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Publication 2003/0180602 (Finn).

Regarding claims 10, 11, 15, 23-24, Finn teaches a solid oxide fuel cell with a textured electrolyte made with yttria-stabilized zirconia ceramic. The surface has a plurality of protrusions having a height less than 5% the average thickness of the

Art Unit: 1745

electrolyte. The surface roughness is 0.5 – 2.5 microns, which gives an average electrolyte thickness of 10 – 50 microns ([0175] & [0177]).

Regarding claims 12-14, the average electrolyte thickness is between 10 and 50 microns ([0175]).

Regarding claim 16, since the electrolyte layer is made from the same material and has the same thickness, it is inherent that it would have the same flexible property.

### ***Response to Arguments***

5. Applicant's arguments have been fully considered but they are not persuasive. In regards to the teachings of Finn, applicant states that Finn only teaches a thickness variation of at least 2 micrometers and proceeds to calculate the average thickness with this thickness. As stated above, Finn teaches thickness variations of 0.5 – 2.5 microns and calculated out with a height of less than 5%, the average thickness has a range of 10 – 50 microns, thus anticipating the instant claims.

6. Regarding the amendment to claim 23, as stated above, Badding teaches a cell with a total ohmic resistance of less than  $0.2 \text{ ohms/cm}^2$  and therefore the electrolyte will be less than the instant claimed limitation of no more than  $0.5 \text{ ohms/cm}^2$ .

7. Applicant argues the teachings of Lawrence are from non-analogous art since the fuel cell described is a polymer electrolyte fuel cell and not a solid oxide fuel cell. While it is true that the features of some fuel cells cannot be incorporated into other fuel cells, this argument is not persuasive in this instance. The Lawrence reference is used to elaborate on the varying thickness of the electrolyte or roughening as taught by Badding. Since Badding teaches roughening the surface of the electrolyte to provide a

Art Unit: 1745

better adhesion of the electrodes but does not speak to any particulars of variations, one skilled in the art would look to the teachings of Lawrence. The electrolyte taught by Lawrence has a surface roughness, which also promotes better adhesion qualities, where the average depth of groove is from 4-10 microns. So while the electrolyte of the polymer fuel cell would not be used in the solid oxide fuel cell, the teachings of how much to vary the roughness of the electrolyte surface would translate from one fuel cell type to the other. Therefore the prior art is analogous and the instant claims are obvious over the teachings of Badding and Lawrence.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Walker whose telephone number is 571-272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KW

  
**PATRICK JOSEPH RYAN**  
**SUPERVISORY PATENT EXAMINER**